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# Urban District of Lakes

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## ANNUAL REPORT

OF THE

## Medical Officer of Health

FOR THE YEAR

1961

KENDAL

TITUS WILSON & SON, LTD.

1962





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Kendal 1296.

Stricklandgate House,  
P.O. Box 18,  
Kendal.

*To the Chairman and Members of the Urban District Council of Lakes.*

SIR, LADIES AND GENTLEMEN,

I have the honour to submit to you my Annual Report on the health of the Urban District for the year 1961.

I wish to acknowledge the help and ready co-operation of my colleague the County Medical Officer of Health, and also the assistance afforded to me by the local general medical practitioners.

I am indebted also to the Public Health Inspector and his staff for the spirit of teamwork which exists in my department, and for the fund of local knowledge which they have laid at my disposal.

I have the honour to be,

Sir, Ladies and Gentlemen,

Your obedient servant,

FRANK T. MADGE,

Medical Officer of Health.



**NATURAL AND SOCIAL CONDITIONS OF THE DISTRICT.**

Area of the Urban district in acres ... ..	49,917
Population (Registrar-General's mid year estimate)...	5,500
Inhabited houses ... ..	1,919
Rateable Value ... ..	£84,293
Product of a Penny Rate ... ..	£336
Rate in the Pound levied ... ..	22/3d.
of which the County Rate was ... ..	15/5d.

The Urban District of Lakes lies in the heart of the English Lake District and is the nucleus of the National Park. About three miles of the north-eastern shore of Windermere Lake is within the District and the inhabited areas are sited along three main valley systems which radiate from the Lake. To the west lie the Langdales, to the north the dales of Rydal and Grasmere, and to the north-east the Troutbeck Valley which leads over the Kirkstone Pass to the geographically detached dalehead of Patterdale and Glenridding at the head of Ullswater Lake. Your Council Offices are situated at Ambleside.

The valley bottoms lie between 150 and 300 feet above sea level in the major western portion, and in the Patterdale area at about 500 feet. The massive crags and fells rise steeply to altitudes of between two and three thousand feet, comprising some of the finest mountain scenery in Great Britain. Some of the valleys are wooded but the fellsides are majestically covered only by brackens and heather. The stone-built houses are scattered irregularly along the valleys, with only two large villages or townships of any size, Ambleside and Grasmere. The District is therefore essentially rural in character. These geographical features determine the natural lines of communication and therefore influence the spread of infectious diseases.

The geology of the District is almost entirely confined to the Borrowdale Volcanic Series of lavas, tuffs and agglomerates with some igneous intrusions. The lavas are mainly andesites with rhyolites at various horizons. The fragmentary rocks resulting from explosive eruptions vary from fine-grained tuffs and ashes to coarse agglomerates and breccias. Lateral pressure has converted some of the tuffs into slates suitable for roofing. In the extreme south of the District the thin bands of the Coniston limestone and Ashgillian series are interposed between the Borrowdale series and the commencement of the Silurian Rocks which stretch away to the south of the County. Workable deposits of non-ferrous metals, particularly lead, are found in the north-eastern part of the District. These geological characteristics are

of great significance in the supervision of water supplies, sewerage and occupational diseases as well as affecting the economics of the District.

The climate is mild and equable in the valleys, and invigorating on the fellsides and uplands. The dales of Rydal, Grasmere and Troutbeck are sheltered from the prevailing westerly winds, and, being open to the south, provide full access to sunshine. The Langdales are more exposed, and Patterdale, though sheltered, has a northerly aspect. Temperature gradient inversions are occasional in the spring and autumn but are soon dispelled in the mornings. The rainfall averages 70 inches a year, but this figure is due more to the heaviness of the rain when it occurs rather than to an undue proportion of rainy days. Snow may be expected for one or two weeks in the late winter.

The District is predominantly a holiday centre for climbing, walking and enjoying the scenery of mountains and lakes, and there is a large influx of seasonal visitors which raises the population to an estimated peak of approximately 8,000. This tourist trade has been imposed upon the basic characteristics of agriculture, mainly sheep-farming, and many of the small local industries are therefore ancillary to agriculture and the holiday trade. There are also slate quarries and knitwear making which provide a certain amount of local employment and stability to the District to help balance the fluctuating conditions of the seasonal trades.

Opportunities for local employment help to check the drift from the countryside. These industries together with the trade associated with the hotels and boarding-houses have provided a limited economic security and local prosperity which is a most important factor in the maintenance of public health.

## STAFF.

Name.	Qualifications.	Office.	Whole or Part Time.	Other Offices.
Madge, F. T. ..	M.D., Ch.B., M.R.C.S., L.R.C.P., D.P.H.	Medical Officer of Health	Part	M.O.H. Combined County Districts of Westmorland
McAdam, J. H. . .	M.A.P.H.I., Cert. S.I.B.	Public Health Inspector	Part	Building Surveyor
Gray, M. . .	—	Clerk	Part	—
Machell, B. M. . .	—	Clerk to Medical Officer, of Health	Part	Clerk to M.O.H. Combined County Districts of Westmorland

### Staff Changes.

There were no staff changes during the year.

## COMMITTEES.

The Minister of Health requires me to include a list of your Council's committees which are concerned with matters of public health.

The Health Committee deal with the principal matters, but there are other aspects of public health importance which are dealt with by the Water, Highways, and Housing Committees.

## VITAL STATISTICS.

The following extracts are made from information supplied by the Registrar-General, with figures for 1960 for comparison.

Area of the District in acres      ...      ...      ...      49,917

	1960	1961
Estimated civilian population (mid year) ..	5,400	5,500
Live Births. Legitimate— males .. ..	31	33
females .. ..	23	20
Illegitimate— males .. ..	1	3
females .. ..	1	1
Total .. ..	56	57
Crude Rate per 1,000 population	10.3	10.3
Corrected Rate per 1,000 population .. .. .	10.6	10.6
Birth Rate for England and Wales .. .. .	17.1	17.4
Illegitimate Birth Rate per 1,000 population .. ..	.37	.72
Illegitimate Birth Rate per 1,000 live births. .. ..	35.6	70.1
Still Births. Legitimate— males .. ..	1	—
females .. ..	—	1
Illegitimate— males .. ..	—	—
females .. ..	—	—
Total .. ..	1	1
Total (live and still) births ..	57	58
Rate per 1,000 total (live and still) births .. .. .	17.5	17
Rate for England and Wales ..	19.7	18.7



	1960	1961
Deaths. males .. .. .	35	33
females .. .. .	57	42
Total .. .. .	92	75
Crude Rate per 1,000 population ..	17.03	13.6
Corrected Rate per 1,000 population	13.4	11.7
Rate for England and Wales ..	11.5	12.0
Infantile Deaths (under 1 year)		
Total deaths under 1 year.. ..	1	3
Rate per 1,000 live births .. ..	17.8	52.6
Rate for England and Wales ..	21.7	21.4
Legitimate .. .. .	1	2
Rate per 1,000 legitimate live births	18.5	37.7
Illegitimate .. .. .	—	1
Rate per 1,000 illegitimate live births	—	25
Neonatal Deaths (under 4 weeks)		
Total neonatal deaths ..	1	2
Rate per 1,000 live births ..	17.8	35
Rate for England and Wales ..	15.6	15.5
Early Neonatal Deaths (under 1 week):		
Total early neonatal deaths ..	1	1
Rate per 1,000 live births ..	17.8	17.5
Perinatal Mortality		
Stillbirths and deaths under		
1 week.. .. .	2	2
Rate per 1,000 total (live and		
still) births .. .. .	35	34.4
Maternal Mortality:		
Total Deaths .. .. .	—	—
Rate per 1,000 total (live and		
still) births .. .. .	—	—
Rate for England and Wales ..	0.39	0.33

Deaths from certain causes:—						1960.	1961.
Cancer	...	...	...	...	...	18	14
Measles	...	...	...	...	...	Nil	Nil
Whooping Cough	...	...	...	...	...	Nil	Nil

The main causes of death were:—

Heart Disease	...	...	...	...	...	39
Cancer	...	...	...	...	...	14

## COMMENTARY ON THE VITAL STATISTICS.

### Population.

The 1951 Census showed your population to be 6,096 persons, made up of 2,664 males and 3,432 females. That total was 4.7% above the figure of the 1931 Census.

The preliminary report of the 1961 Census was much the same at 6,061 persons, made up of 2,671 males and 3,390 females. The Registrar-General's estimate for the present year was 5,500.

However, a look round suggests that your population is fairly stable, and a proper perspective cannot be obtained by considering merely one year's changes. It is the general trend of population which is important for the planning of your future housing, water and sewerage requirements, and for the broader issues of the economic prosperity of your district.

One fact is certain: you have not maintained your population by your own reproduction. You have relied upon the yearly immigration of people from other areas to keep up your numbers. That is why you have a predominantly elderly population. The 1951 Census showed that the nett immigration since 1931 amounted to twice your natural decline by excess of deaths over births. Only about 55% of the people in Westmorland were born in the County.

### Birth Rate.

Your corrected birth-rate is 10.6 per thousand of the population. For many years it has been deplorably low, a mere half to two-thirds of the national rate. If your native community is to survive you must raise your birth rate well above your death rate, and to do that you will have to recapture and hold the faith of your young people in country life.

### **Still Birth Rate.**

The still birth rate was statistically insignificant.

### **Death Rate.**

Your death rate was above the national rate. It fluctuates either side from year to year, but it is never far from the national figure. I do not attach much significance to those variations. Heart disease and cancer take the biggest toll.

### **Infantile and Neo-natal Deaths.**

There were two infant deaths. Your figures are too scanty to carry statistical significance on their own merits, but as they run parallel with the figure for England and Wales I feel that they do reflect a very satisfactory improvement in child-care by the local doctors, nurses and, above all, by the young mothers in their homes.

### **Maternal Mortality.**

Your clean record has been happily maintained.

## **PREVALENCE AND CONTROL OF INFECTIOUS AND OTHER DISEASES.**

*Public Health Act, 1936. Sections 143-170.*

*National Health Service Act, 1946. Part III.*

The general incidence of illness can be assessed by the weekly number of new claims for sickness benefit at our local National Insurance offices. A logarithmic graph of those figures shows a regular seasonal pattern over the year, and any variations are usually worth investigating.

Measles continued over from the end of the previous year, and affected Ambleside mainly during January 1961, with very little involvement of the other parishes. The outbreak was associated with an epidemic in Kendal at about the same time of the year. The course of the disease was generally quite mild.

Whooping Cough occurred in Ambleside during April and May. For the rest of the year all was quiet.

It is pleasing to record that the notification of infectious diseases has much improved in recent years, and I am very grateful to my colleagues in general practice for their prompt help in this respect. I look upon the control of notifiable diseases as one of the most important duties of our department.

## **Mountain Accidents.**

Accidents on our mountains are a special hazard in this District. A regular toll of death and suffering happens every year. Most of these accidents are preventable, and they mostly affect our visitors.

The inexperienced, the unlucky, and the foolhardy, fall out of crags while rock-climbing, lose themselves in the dark and the mist and snow. The physically unfit die of exhaustion, exposure, and the heart attacks which catch up with them sooner than need be. The suicides make their last gesture to the emotional appeal of the mountains.

Someone has to turn out to look for them, and rescue them, and bury them. A magnificent local organisation of search and rescue teams has been built up in the District to meet these demands. But we wish that trade might not be so brisk.

A campaign for the prevention of mountain accidents has been organised not only in your District, but also back into the big towns from which our visitors come, and to a wider audience on radio and television. We hope it may help.

NOTIFIABLE DISEASES TABLE.

	Total	Ages										Admitted to Hospital	Deaths	
		-1	1-	2-	3-	4-	5-	10-	15-	20-	35-			45-
Measles .. ..	63	--	4	6	6	9	25	7	5	--	1	--	--	--
Whooping Cough ..	15	1	1	3	1	--	6	2	--	--	1	--	--	--
TOTAL .. ..	78	1	5	9	7	9	31	9	5	--	1	--	--	--



## TUBERCULOSIS.

Tuberculosis is the most important communicable disease of our time. Its prevention is primarily dependent upon social and economic factors in the general community, and secondarily upon the management of the established case. Your Council's functions are three-fold: to investigate the source of infection, to prevent the spread of infection, and to remove conditions favourable to infection.

The number of tuberculous patients on the register at the year end were :—

		1960.	1961.
Respiratory	...	17	10
Non-Respiratory	...	1	—
		—	—
		18	10
		—	—

### TUBERCULOSIS TABLE.

Age Periods	NEW CASES				DEATHS			
	Respira- tory		Non-res- piratory		Respira- tory		Non-res- piratory	
	M	F	M	F	M	F	M	F
0 ..	—	—	—	—	—	—	—	—
1 ..	—	—	—	—	—	—	—	—
5 ..	—	—	—	—	—	—	—	—
15 ..	—	—	—	—	—	—	—	—
25 ..	—	—	—	—	—	—	—	—
35 ..	—	—	—	—	—	—	—	—
45 ..	—	—	—	—	1	—	—	—
55 ..	—	—	—	—	—	—	—	—
65 ..	—	—	—	—	—	—	—	—
Total ..	—	—	—	—	1	—	—	—

During the spring of 1961 we had another of the periodical visits of the Mass Radiography Unit of the Manchester Regional Hospital Board. 679 people were X-rayed at Ambleside, and 145 at Grasmere. Only those over 15 years of age were accepted in this survey, and it was the first time that the Unit had visited Grasmere.

I should like to see many more of our local population take advantage of this valuable service. It not only detects pulmonary tuberculosis at the most favourable time for a cure, but it also provides an early warning against many other chest conditions, lung cancer, and certain heart diseases.

At the time of going to press we had not received any analysis of results especially applying to the Grasmere and Ambleside visits, but we do know the results for the whole 11,206 persons X-rayed in the Kendal, South Westmorland, Lakes and Windermere tour.

13 cases of active pulmonary tuberculosis were discovered in the whole area: 6 of them were in the groups examined from factories and offices, and 7 cases were among the general public who volunteered for X-ray. 10 were men and 3 were women. This is rather a high rate for a predominantly rural region, being 1.8 per thousand, as against 0.97 per thousand at the previous survey in 1957. All these 13 cases needed either close clinic supervision or treatment in hospital. Waiting time is nowadays very short for admission to hospital, and modern drugs achieve most promising results for returning the patient to a useful working life.

12 other cases of non-active pulmonary tuberculosis were revealed, requiring only occasional out-patient supervision. It is especially important to discover these cases, so that we can do all in our power to prevent them breaking down into a more active state.

4 cases of malignant cancer of the lung and 2 cases of non-malignant growths were found, and over 80 cases of abnormalities of the heart.

Such discoveries more than justify the visits of the Mass Radiography Units to our area at regular intervals. I think that we should do all we can to make really excellent arrangements for their reception in our townships and villages, and encourage our local people to turn up in full force for their chest X-rays.

### **The Hospital Services.**

#### *National Health Service Act, 1946. Part II*

The smaller northern part of your District lies in the area of the Newcastle Regional Hospital Board, and the general hospitals at Carlisle have traditionally served the needs of our Patterdale folk, and it seems likely that they will continue to do so.

The larger southern parts of your District lie in the area of the Manchester Regional Hospital Board, and most of the general needs of our local people have historically been met by the Westmorland County Hospital at Kendal. Some of the more specialised services have always had to be referred to more distant centres. But there are signs of change ahead.

The Government's national policy to develop what are to be called District Hospitals seems likely to mean that our local folk will have to rely more and more on Lancaster, and less on Kendal, as the Hospital Plan comes into effect in the next ten years.

Some people think that Westmorland risks being left rather ill-served if the hospital services concentrate themselves on Lancaster and Carlisle. There is a lot of territory in between, and transport communications are not very easy for out-patients and visiting relatives to get to those hospitals and home again.

On the whole the Regional Hospital Boards have very much neglected public relations during their thirteen years of existence, and consultation with local opinions and feeling has been rather poor. It does not seem too unreasonable for the man in the street to ask whose hospitals are they anyway? The Hospital Service might do well to foster a closer relationship with the ordinary people they claim to serve.

Another facet of this same problem arose during 1961 when the published intentions of the Manchester Regional Hospital Board seemed to imply that all the maternity and antenatal beds to serve our district would be concentrated at Lancaster, and that Helme Chase Maternity Home at Kendal might be closed within ten years. After strong representations by all the county district councils in southern Westmorland, an assurance was given by the Manchester Regional Hospital Board that Helme Chase should continue as a general practitioner maternity home, and that consultant services should continue to be available in Westmorland. Public sentiment seemed to be particularly strong about preserving some maternity beds in a place where the local women wanted them.

I think that the Regional Boards are gradually becoming more sensitive to public opinion, and no doubt there will have to be give and take on both sides before the new Hospital Plan assumes its final pattern for serving those ordinary folk who pay their taxes to cover the enormous cost of experiment. Such philosophies have a considerable impact upon the public health.



## **Hospital and Ambulance Arrangements for Infectious Diseases.**

*National Health Service Act, 1946. Parts II and III.*

Hospital accommodation for infectious diseases is provided by the Manchester and Newcastle Regional Hospital Boards at Lancaster and Carlisle. Smallpox cases will be admitted to the Ainsworth Smallpox Hospital near Bury.

Ambulance transport for cases of infectious disease is provided by the Westmorland County Council.

## **Disinfection Arrangements.**

Disinfection facilities for clothing and bedding are not very satisfactory owing to the lack of a steam disinfecter. Reliance is therefore placed usually upon disinfection with formaldehyde in the patient's house. Disinfection of premises and other chattels is carried out locally and presents no special problems.

## **HOUSING.**

### **Housing Acts.**

Under the Housing Acts your Council has a duty to consider the general housing conditions in your District, to ascertain whether any are unfit for human habitation, and to assess the need for further houses. You have powers to deal with unfit houses, powers to provide new houses for all classes, and various powers and duties in the management of your Council's housing estates. Good housing conditions are an integral part of public health.

### **Present Housing Position.**

*Housing Act, 1957.*

There are 1,919 inhabited houses in your District. With an estimated population of 5,500 the average number of persons per house is 2.8. This figure is purely hypothetical since many of the better houses have only one or two occupants, and a number of the smaller houses are occupied or let furnished only in holiday times by absentee landlords.

It is probable that the dalesmen's houses have an average of at least four persons per house, which is not excessive for a normal-sized family, and there is probably little overcrowding within the strict definition of the Housing Act. It is temporarily increased during the peak of the holiday season, but no certificates under Section 80 of the Housing Act, 1957, have been granted by your Council to authorise exceeding the permitted numbers.

## **General Progress of Slum Clearance and Improvements.**

Westmorland as a whole has made very encouraging progress in post-war slum clearance despite all the difficulties of the times. Since the campaign was resumed in 1948 well over 1,000 houses in the County have been dealt with by formal action under the Housing Acts. Most of these will eventually be demolished or converted to trade use, but many of them have been reprieved by their owners undertaking to spend considerable money for comprehensive reconditioning up to modern standards. In addition to those formal actions there have been a very creditable number of informal schemes for the renovation of sub-standard houses, either with the aid of improvement grants or entirely by private enterprise. The aim is to save a house wherever possible, but if it cannot be brought up to an acceptable standard of safety, decency and amenity the sooner it is swept away the better.

The Housing Act offers financial grants to owners to recondition existing houses in a comprehensive manner, and I hope that owners of Class 4 and 5 houses will consider the possibilities of each house with a view to maintaining the architectural traditions of the District and making decent houses for our dalesfolk.

The Housing Repairs and Rents Act, 1954, required your Council to declare their proposals for dealing with sub-standard houses. You resolved to deal with the estimated 87 unfit houses within ten years. The Minister of Housing and Local Government approved the proposals, and they are now on deposit for public inspection.

We were able to make good progress with the worst of the 87 unfit houses in the programme, so that when the Minister called for a review at half-time in 1960 we reckoned that only about 41 houses remained for action of some sort. The figures were steadily being whittled down by informal reconditioning.

The Minister urged us to condemn the outstanding 41 unfit houses in a shorter period than 5 years, but we were able to convince him that we experience an unusually high proportion of reconditioning old stone cottages in our National Park, albeit at unreasonable expense, and that we feel it desirable to preserve the architectural features and grouping of our Lakeland villages, hamlets and farm houses. We have tried to foster such preservation without too much doctrinaire destructive pressure under slum clearance programmes.

At the end of 1961 we calculated that there were only about 30 houses outstanding on the programme list, and I really do not expect to have to take formal condemnation action against all of them. Proposals for reconditioning old cottages keep coming in even faster,



and the whole programme is very fluid. We shall have to get a clearer picture nearer the completion date, 31 December 1965, and at this present stage I can do no more but say that our restrained and patient policy seems to be paying off, better than if we had rushed around with bulldozers.

### **Closing Orders.**

*Housing Act, 1957. Section 18.*

No closing order was made during the year, 5 such orders are on the register of local land charges. 3 of these houses are still occupied.

### **Undertakings not to use for Human Habitation.**

*Housing Act, 1957. Section 16.*

5 undertakings not to use a house for human habitation were accepted during the year, leaving 28 such undertakings on the Register of Local Land Charges at the year end. 3 of such houses are still occupied.

### **Undertakings to Repair.**

*Housing Act, 1957. Section 16.*

No formal undertaking to execute works of repair was accepted during the year. One such undertaking remained on the Register of Local Land Charges at the year end.

### **Improvement Grants.**

*House Purchase and Housing Act, 1959.*

Discretionary improvement grants were approved during the year for 1 house.

Standard grants during the same year numbered 11.

### **Demolition Orders.**

*Housing Act, 1957. Section 17.*

No demolition orders were made during the year.

There were no demolition orders outstanding on the Register of Local Land Charges at the year end.

### **Clearance Areas.**

*Housing Act, 1957. Section 44.*

Five out of the six cottages at Township, Patterdale were cleared during 1956 and made room for a much needed road widening on a bad corner. The remaining cottage is well out of the way, but it is

still occupied by the original tenant who was there when the clearance order was made by the West Ward Council some quarter of a century ago. A monument to independance of the spirit.

Three old houses in a very congested part of Pinfold Row, Ambleside, were made subject to a Clearance Order during 1957. After a public inquiry the Minister of Housing and Local Government confirmed the Order. During the year the last one was demolished, thus completing the clearance order.

### **Estimated Requirements for New Houses.**

*Housing Act, 1957. Section 91.*

Your District is perhaps one of the most difficult areas in the whole country to assess for its new housing needs. It is subjected to so many outside pressures and influences, often operating far behind the scenes. On one hand there is a noticeable planning resistance to much new housing development in the remaining open areas of the National Park, and on the other hand there is the steady take-over of our traditional dalesfolks' homes to make holiday cottages for outsiders with more money to spend on them.

It is a quietly fought battle, sometimes grimly contested, and often with very mixed issues. Those of the younger generation who have resisted the call or the push to emigrate are not content to settle down to a primitive way of life in the ancient family cottage. If they stay in Lakeland they claim the decencies and comforts of modern living. They could not afford to modernise the old places even if they wanted to. Some of the offcomers who retired here have found it hard to adapt themselves to rural cottage life. Perhaps the outside economic pressures operate for the greater good after all. Certainly the financial blood transfusions from beyond our borders have saved many picturesque ancient cottages from destruction as well as stimulating local trade. But the whole situation complicates assessment of your new housing needs.

What we do know for a fact is that there were 120 applicants on your waiting list for Council houses during the year. 30 of those families were without a separate home of their own, and 90 families wished to exchange their old houses for a Council one.

Some of those people who wish to be rehoused are living in condemned property or cottages which are on the list for condemnation. Your Council have recently made a determined effort to clear the condemned premises, and at the year end there were still 5 such families awaiting the move. We reckon that about 27 other families

still live in cottages which are condemnable, and where the cost of reconditioning is not economically attractive to their present landlords with sitting tenants in occupation. No doubt many of those little houses will eventually be saved by outside purchasers willing to recondition them for owner occupation or holiday lettings.

Some of the families in the condemnable houses have not yet put themselves on your formal waiting-lists, and there are some other people, now residing outside the area, who would like to live nearer their work within the District, or just live there anyway. Perhaps the need is not quite the same thing as the demand but is estimated at about 50.

### **House Building Progress.**

Since the end of the 1939-45 War and up to 31st December, 1961, your Council completed 117 houses.

The selection of centrally placed sites I feel will be particularly important for old people who need some community help in the time of their difficulties, but who enjoy the pride of their independence at other times.

During the same post-war period 53 houses were completed by private enterprise, 6 during the current year.

### **Tenants Selection.**

The present method of selecting tenants for your Council houses is for all the applications to be considered and then selection is made according to need. No points system is in operation and there is no anonymity. This results in a considerable amount of personal canvassing by the more persistent applicants.

### **Housing Management.**

Your Council now own 174 houses. Routine repairs and maintenance are carried out by local contractors. Your present estates do not justify the employment of direct labour, but in the years to come the number of your houses will be increased and the maintenance will require constant attention and you may be faced with considerable reconditioning of the rural houses.

The rents of your Council houses vary between 17/8d. and 34/6d. exclusive of rates. From these figures you will see that the present day building costs will not enable you to maintain low rents on your new houses unless there is a substantial increase in the rate of Government subsidy.

Your Council decided to charge an extra rent to those tenants who



had allowed married children or relatives to live with them. An exception is however made in those cases in which aged parents no longer at work are being housed by their family. An additional rent is also required from tenants who use their houses for boarding visitors or for bed and breakfast guests.

The rateable value of your Council houses vary between £12 and £24.

The examination of rentals and rates may not seem at first to have much to do with public health, but it does have considerable significance. It is not unknown for persons who have been rehoused from poor quarters into modern Council houses to have to pay their rents and rates from the portion of their income which rightly belong to the purchase of food. Domestic economy can effect the general standard of the public health almost as much as environmental conditions, and some attempt must be made to maintain a balance between these conflicting factors.

### **Verminous Houses.**

*Public Health Act, 1936. Sections 83-85.*

No action was necessary during the year.

### **Nuisances and Notices re Dwellings.**

*Public Health Act, 1936. Sections 91-100.*

During the year the following action was taken:—

Preliminary Notices served	...	221
Statutory Notices served	...	Nil

In no case was it necessary to obtain an Abatement Order from the Court.

### **Certificates of Disrepair.**

*Housing Repairs and Rents Act, 1954. Section 26.*

No certificates were issued during the year.

### **Dangerous Buildings.**

*Public Health Act, 1936. Section 58.*

No action was taken during the year.

### **Caravans.**

*Caravan Sites and Control of Development Act, 1960.*

The 1961 season was the first year of administering the new Caravan Sites Act, and the Regulations and model standards introduced at the same time. We have been able to bring caravan sites under much better control, and I believe it will be to the mutual advantage of the caravanners, our local residents, and all the other users of our National Park.

At the end of the year there were 10 licensed sites, holding some 200 caravans, although most of them were concentrated on one large model site at White Cross Bay. 4 other applicants for licenses were pending, for sites which will hold about another 60 caravans, and we were chasing a small handful of site operators who were evading their obligation to apply for licenses.

The introduction of the Caravan Sites Act into our Lakeland valleys has been smooth and effective. We have enjoyed the help and support of the Lake District Planning Board, and the National Trust, and most of the land owners. We have deliberately set a high standard, and the site operators have accepted that policy: indeed some of them have gone much further to enhance the attractions and service on their sites. We have had many discussions with them about the interpretation of the new laws, and they appreciated our practice of framing the licence conditions to be tailor-made to fit their own particular site. Perhaps that is why there has not yet been one single appeal to the Courts throughout Westmorland against our quite stringent conditions on the hundred or more caravan site licences. Everyone now accepts the idea that second-rate sites are not good enough for our National Park, and I am more than grateful for the enthusiastic support of all our enlightened caravan site operators.

An extra special effort was made during 1961 to formulate plans for the longer term problems of caravanning and camping in Langdale. A joint meeting was held between representatives of your Council and the Lake District Planning Board, and it was decided that a large new site should be sponsored by one of the public authorities, and that certain other designated smaller sites could well be developed by their owners.

A site for possibly some 60 to 80 caravans, a dozen or more chalets, and perhaps 75 to 100 tents, was investigated at Neaum Crag, Skelwith Bridge, in conjunction with the Lake District Planning Board. At the year end, efforts were in train to see how the difficulties could be overcome for access, water supplies and other site works.

### **Tents, Vans, Sheds and Movable Dwellings.**

*Public Health Act, 1936. Sections 268-270.*

The control of tented camp sites is still very haphazard: this is due partly to the weakness of the law, and partly to the physical impossibility of patrolling the whole district at peak holiday times.

During the year 2 licences were in force for tented camping sites: these were well operated, and were the least of our troubles. Our major problems arise each season from the host of casual tents which



appear on our roadside verges, our commons, odd fields, and even on mountain tops.

This fiercely individualised mode of spending the night in our National Park is characterised by primitive sanitary arrangements which are often highly dangerous to the public and private water supplies, apart from any aesthetic considerations: piles of putrescent refuse and unsightly litter mark the more popular spots: the campers often add to their own risks by drinking unboiled water taken from polluted becks, and complain reproachfully to me when they recover from the dramatic consequences.

But it would be a mistake to think that all our camping visitors behave so fecklessly, or that they are like the small number of rowdies and hoodlums who doss down in tents and barns, and cause so many complaints of vandalism and bad behaviour at Bank Holiday weekends. Some of our tented campers bring with them all the proper know-how of field craft, and I should particularly like to record my praise of the magnificent standards of camp hygiene practised by the Boy Scouts, Girl Guides, and most of the Army and cadet units, who are our guests in summertime.

Nevertheless there is a rapidly growing tendency for even officially organised schemes to include camping out in the higher mountains, sometimes endangering the gathering grounds of the public and private water supplies. Adventure Training courses for school cadets and Service units, the Duke of Edinburgh's Award schemes, and various other Youth Organisations, need to be especially aware of the areas where we should prefer them not to indulge in primitive sanitary arrangements. I am sure that they will co-operate in safeguarding the public health, and we are now seeking some more efficient liaison machinery to assist these excellent outdoor Youth activities on our fells. There is plenty of available space.

Of course we expect that the members of such properly organised parties will behave sensibly, but we never feel so sure about the casual visitor with a tent on the back of his car, his bicycle, or tied to his rucksack. He probably does not possess so much know-how, and the reminders for self-discipline may not be so pressing. He soon finds out that our district is desperately short of enough properly serviced sites for tented camping, and so he makes his rather bad best of what is perhaps our own bad job. We have seen the dangerous and disgusting results on Elterwater Common and at Wall End Langdale of this "I'm all right Jack" attitude to tents and bivouacs. The only sane long-term solution is to see that enough decent

safe sites are provided, and looked after so well that all but the cranks and the crooks will be attracted to them.

It would not do to get these camping problems out of perspective. There are still miles and miles of unblemished scenery all over the District, but we should not care to see them spoilt. And we have the public health to think of as well: ours and the visitors'.

## WATER SUPPLIES.

*Water Act, 1955.*

### General.

The public water supplies are installed in six areas of your Urban District: Ambleside, Grasmere, Hartsop, Chapel Stile, Patterdale and Little Langdale. The quality of the Ambleside and Grasmere supplies is satisfactory after treatment, but the Chapel Stile supply is variable. The results of laboratory examinations of the raw and treated waters are set out in Appendix "A".

The Grasmere supply is unfailing in quantity. The Ambleside supply is generally adequate except in periods of drought, when the grossly excessive consumption makes it necessary to purchase water from the Thirlmere aqueduct of Manchester Corporation.

The Chapel Stile supply runs very short in dry weather, but your Council has a chlorinated ancillary supply from the main beck.

The Hartsop supply completed in 1949, and the Little Langdale supply in 1951, seem to be meeting the local needs of those two small communities, and completion of the main Patterdale scheme has recently brought much needed relief.

Outside the areas of the public water supplies conditions are generally poor. There are a few small privately-owned systems of varying quality, and the rest of the District relies upon becks, small runners, superficial springs, and the surface drainage catchpits, unreliable in yield and many of undesirable quality.

No comprehensive survey has been made of individual private water supplies, and staff shortage precludes one.

Shortage of water is brought to my notice in times of over a fortnight's dry weather by the frequent complaints of distress from the village of Troutbeck and other outlying areas. It is ironical that a district with 70 to over 100 inches of rain in a year should be short of water, but the reason is that impervious volcanic rocks cause a rapid run-off and the storage capacity of privately-owned systems has been dictated more by economy than foresight. The quality of the average



private supply fluctuates widely, and I can do no more than warn the users that they drink it at their own risk, that they should have it tested for purity at regular intervals, and that if in doubt they should boil it.

1961 will be the last full year of your Council's historical role as the statutory water undertakers for your District. Next year will see the transfer of functions to the newly formed Lakes and Lune Water Board. You will of course still be expected to see that the quality of the public water is properly maintained, and you will no doubt wish to press the Water Board to extend the areas of supply.

We shall continue to operate the excellent liaison arrangements with the Westmorland officers of the Ministry of Agriculture, Fisheries and Food, for the joint investigation and assessment of applications for grant-aided farm water supply schemes. I have been most grateful for the longstanding co-operation of the Ministry's Regional Advisory Bacteriologist and the other staff at the Regional Headquarters in Newcastle-upon-Tyne. It enables us to co-ordinate the safeguards to the public health as well as the agricultural interests.

### **Safeguarding of Purity.**

A scheme for the general safeguarding of the purity of the public water supply was instituted during 1948. The elementary precautions of the medical examination of workmen, and the regular laboratory examination of the water should protect a popular holiday area from serious water-borne diseases.

### **Natural Radioactivity of Drinking Water.**

Samples of water were taken during 1961 from the headworks at the five upland surface sources, and the one set of underground springs, which provide the public drinking water for your District. In all instances the natural radio-activity was very low, being less than 0.1 Micro-micro-curies per cubic centimetre of gamma activity.

Similar tests were made in the same year on all the other public drinking water supplies throughout Westmorland, where varying small levels of natural radioactivity were found in sources derived from the sedimentary rocks. It was therefore interesting to find that we have so low natural activity in the water from our own igneous rocks in the Borrowdale volcanic series.

The results of these tests for natural radioactivity are mainly of pure scientific interest at the present time. It is too early to assess what effect, if any, there might be on health.

No estimations were sought for beta activity, the fallout of fission products from atomic bomb tests in other parts of the world. The reason was that the requisite elaborate radiochemical analysis facilities are not reasonably available to us. Nevertheless, the fallout has been regularly monitored by various other Authorities who use our area as one component in building up a picture of the national and international pattern of deposition from the atmosphere. From time to time they publish selected results of their findings, so we are able to get some idea of what comes down with our local rainfall. But at the present time too little is known about the effects of these fission products upon the human body and future generations. All we have to remember is that we are in the second half of the 20th century.

### **General Provision of Baths and Sinks.**

The 1951 Census showed that your District held 1,534 households, of whom 675 (or 44%) had no fixed bath. 165 of them had no kitchen sink. I hope that the introduction of standard grants will go some way towards remedy of this need, and it will be interesting to see what improvements will be shown when the 1961 Census figures become available.

## **SEWERAGE.**

### **Disposal Methods and Works.**

*Public Health Act, 1936. Section 15.*

Public sewerage systems are at present very limited in the District.

### **Ambleside.**

Ambleside is the only area within your District which possesses a sewage disposal plant of any size. These works had not been functioning efficiently, due to disrepair, and certain shortcomings in design. The final effluent was very variable in quality during normal working and extremely bad during the bizarre weekly flushing technique, causing massive pollution of the river with untreated sewage.

Your Council's consulting engineers submitted to you during 1949 a scheme for major reconstruction of the works, but as the cost was very high an alternative proposal was made to effect certain improvements and urgent repairs which may at some future time be incorporated in the larger scheme. These repairs were completed in 1955, and included the very much needed extensions of the sludge drying-beds, and the replacement of the obsolete gas engines with automatic electric compressors for the ejector system bringing sewage from Waterhead.

During 1959 your Council decided to proceed with the major reconstruction scheme and the Minister of Housing and Local Government held a Local Inquiry in April 1960, and subsequently gave consent. Construction was started during 1961, and was still in progress at the year end.

### **Chapel Stile.**

Chapel Stile is sewered into a large septic tank which has an outfall into the river. It is not satisfactory in operation, and inadequate for any further development. In spite of routine emptying by your Council, the tank overflows crude sewage into the river, and there is no room for secondary treatment. Chapel Stile really needs a complete new disposal works as the only practical alternative to polluting Great Langdale Beck.

### **Troutbeck.**

Troutbeck has a short length of sewer which serves only a few houses and leads into a small septic tank belonging to your Council. It does not seem to give much trouble. It is hardly worthy to be classed as a disposal works and it would be unlikely to carry much additional load.

### **Patterdale.**

Patterdale is sewered by a short length of piping into a septic tank belonging to your Council in Robinson's field.

No public sewerage exists in Glenridding, Rydal and Little Langdale, nor in the more scattered rural hamlets and townships.

We were rather concerned during 1961 by a proposal to raise the level of Ullswater lake to make a reservoir for Manchester. It would have increased our difficulties with some of the private sewage disposal tanks around the shore. However, the scheme now seems to have been dropped for other reasons.

### **Grasmere.**

The greatest need for a proper public sewerage system and an efficient disposal works is in Grasmere. It has neither at the moment. There is a very primitive sewer which serves only a small part of the township and gets some sort of partial treatment in a tank at Pavement End, but most of Grasmere empties into a host of individual cesspools, cesspits and septic tanks, and there are even privies in the middle of the village. The tanks are mostly obsolete and inefficient.



Many of them were designed for much smaller loads when they served the private houses which since became turned into hotels, boarding-houses and catering places. Many are quite unable to cope with the huge influx of seasonal visitors into Grasmere, the day-trippers and the passing motorists.

The foul effluents from these rudimentary and overloaded tanks overflow on the surface when they cannot soak away into the gravel subsoil, or get into the beck running through the village, or they pollute the shore and water of Grasmere lake. A lot of complaints are heard from residents and visitors about the unpleasant smells in the central parts of the village, and there are definite risks to public health.

Your Council during 1960 instructed your Consulting Engineers to explore the possibilities of installing a public sewerage system and disposal works. It will probably be a difficult and expensive scheme but it is sorely needed to abolish the privies and the tanks and the smells.

By the end of 1961 most of the preliminary survey work had been done, and your Consulting Engineers were almost ready to submit their outline scheme for your approval. Not only will Grasmere Village be provided with sewers, but it may be one of the first places in this country to have the disposal works out of sight, entirely underground. This would be a most progressive step, and it must be welcomed as exemplary practice in a National Park, and particularly in such a precious village as Grasmere.

### **Prevalence of Water-closets and Other Methods.**

Water-closets have been installed mainly in the areas which are served by public sewers and in the better type of house where private sewage systems have been made. The 1951 Census showed that 289 households, or roughly a fifth of your houses were without a water-closet. It will be interesting to see what improvements will be revealed by the 1961 Census figures when they become available.

### **Conversions.**

*Public Health Act, 1936. Section 47.*

12 conversions to water-closets were made during the year, and no grants were made by your Council for this purpose.

As your District is the nucleus of the National Park and will receive an increasing number of holiday visitors from this country and overseas, it is most desirable that the extension of your sewerage schemes shall be followed by the conversion of earth-closets, privies

and privy-middens to more hygienic water-closets. I hope that full advantage will be taken of standard grants.

### **Public Conveniences.**

*Public Health Act, 1936. Section 87.*

Public conveniences are situated at Ambleside, Glenridding, Grasmere and Waterhead. From time to time they suffer grievously at the hands of hooligans who do wanton damage to the fittings and exercise their perverted artistic talent on the walls. It seems a curious trend in public morals, but the sheer malicious damage of pipes, seats, pedestals, and other fittings, all public property, is so sad. Perhaps the answer lies somewhere in the field of preventive psychiatry.

The sewage disposal from your Council's public convenience at Glenridding is not safe. The partially treated tank effluent wells up periodically in the recreation ground at Jenkin field. It was particularly bad again during 1961, and a sewage sodden area of the recreation ground had to be fenced off as an emergency measure. I recommend that a permanent remedy be found for this annually recurring dangerous nuisance.

## **PUBLIC CLEANSING.**

### **Refuse Collection.**

*Public Health Act, 1936. Section 72.*

Domestic refuse is collected from the whole of your District with the exception of a few detached and isolated dwellings. Your Council's own vehicle and staff are used for the work.

### **Refuse Disposal.**

*Public Health Act, 1936. Section 76.*

Disposal of refuse is carried out by partially controlled tipping on three sites at Grasmere, Patterdale and Brathay.

The whole matter of refuse disposal has always been a difficulty in your District. You need more labour to conduct your tips properly and you may need to acquire covering material. Controlled tipping ought to be universal in a National Park, and the creation of serious nuisances is indefensible. I think you should aim at centralising your tips, thus limiting the nuisances and favouring better supervision of the tip faces.

**Street Cleansing.**

*Public Health Act, 1936. Section 77.*

The work is undertaken by the Highways Department, and the streets are well maintained.

**FOOD AND DRUGS.**

**General Powers.**

*Food and Drugs Act, 1955.*

Your Council bear most of the statutory responsibility for safeguarding the public from foodborne diseases. The main aim is directed towards securing proper and hygienic conditions for the manufacture, preparation and sale of food. The secondary aim is to trace and localise any outbreaks of disease which may occur in spite of preventive measures.

**Precautions against Contamination.**

Food hygiene is steadily improving throughout your area. Public opinion is well ahead of the law and most traders are aware of the fact; the good food trader does not need official instruction in basic cleanliness or the enforcement of legal minimum standards. He may welcome advice on technical problems, but his aim is how high he can get, not how low he can get away with.

The responsibility for safe food does not rest entirely with the trader as the housewife must play her part as well. Quite a lot of strange things happen to food between the shop counter and the dinner plate, and the educational campaign has had to be carried into the home.

Foodborne diseases, mild dysenteries and attacks of diarrhoea and vomiting are not infrequent in our homes and among our visitors. I am confident that higher standards will reduce these preventable diseases.

**Ice-Cream Trade.**

*Food and Drugs Act, 1955. Section 16.*

*Ice-Cream (Heat Treatment, etc.) Regulations, 1947.*

The following premises were registered under Section 16 of the Food and Drugs Act, 1955:—

Manufacture by hot mix, cold mix, storage and sale	...	1
Manufactured by cold mix, storage and sale	... ..	Nil
Storage and sale only	... ..	43



**Prepared Meats.**

*Food and Drugs Act, 1955. Section 16.*

The number of premises on the Register under Section 16 of the Food and Drugs Act, 1955, used for the preparation of sausages, potted meats, pressed meat, and pickled foods was 9 at the year end. No particular difficulties have been encountered in these trades.

**MILK.**

**Registration of Milk Distributors and Dairies which are not Dairy Farms.**

*Milk and Dairies Regulations, 1959.*

Total number of registered Distributors	...	...	...	15
„ „ Dairies	...	...	...	0

**Pathogenic Organisms in Milk.**

*Food and Drugs Act, 1955.*

No samples were sent for biological tests. With the eradication of bovine tuberculosis, it seems likely that the next milkborne disease to be tackled may be brucellosis. I believe that many human cases go unrecognised.

No notices were issued under the Milk and Dairies Regulations prohibiting persons from taking part in dairying activities.

**Licensed Slaughterhouses and Knackers' Yards.**

*Food and Drugs Act, 1955.*

There are no slaughterhouses and no knackers' yards in your District.

**Condemnation of Meat.**

*Food and Drugs Act, 1955.*

All slaughtering is carried out at the Kendal Abattoir where the meat is inspected by the Borough Inspectors. No meat was condemned after distribution in your District.

**Condemnation of Other Foods.**

*Food and Drugs Act, 1955.*

The following foodstuffs were condemned by your Inspector during the year :—

Tinned Meat	...	179 lbs.
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**Method of Disposal of Condemned Food.**

The Minister of Health requires me to describe the current methods for the disposal of condemned food. In this District it is by burial at Ambleside Tip.

**GENERAL INSPECTIONS.**

Your Council employ one part-time Public Health Inspector and his salary is apportioned between his sanitary inspection duties and his other duties in a proportion approved by the Ministry of Health.

The Town and Country Planning Act, 1947, involves a volume of detailed clerical work of an imperative nature which is hardly commensurate with the few powers conferred on your Council. The bulk of this work falls upon the same man.

It is difficult to arrange duties in combined appointments in a small local authority, particularly when an Inspector is single-handed, and there has to be considerable elasticity to cover all the responsibilities.

Your Inspector carries out his duties in a most able manner, and during the year he made 974 inspections on all types of work, but there is a limit to what one man can do in a day, and we are both anxious to maintain the efficiency of our Department in carrying out your Council's responsibilities.

Tabulated summary of work carried out by the Public Health Inspector:—

Housing Inspections	...	...	...	...	...	242
New Houses	...	...	...	...	...	127
Building Byelaws (Town and Country Planning Act)...						218
Food Premises	...	...	...	...	...	20
Factories	...	...	...	...	...	7
Drainage	...	...	...	...	...	112
Infectious Diseases	...	...	...	...	...	3
Rooms fumigated	...	...	...	...	...	1
Caravans	...	...	...	...	...	54
Miscellaneous	...	...	...	...	...	159
Sewerage Disposal	...	...	...	...	...	31
						974

**Offensive Trades.**

*Public Health Act, 1936. Section 107.*

There are no offensive trades in the District.

**Factories.**

*Factories Act, 1937-1959.*

There are 28 factories on the Register. 7 inspections were made and no written notices were served. No Legal Notices remained outstanding at the end of the year. No prosecutions were required. No references were made to H.M. Inspector and none were received from him.

No lists of outworkers were supplied to your Council by factory owners, and I have no official knowledge of any cases of default in this respect.

There are no basement bakehouses in the District.

H.M. Inspector of Factories has been given details of your Urban District's administration of the relevant sections of Parts I and VIII of the Factories Act, 1937.

**Factory Inspections.**

Premises.	Number of Premises.	Number of		
		Inspections.	Written Notices.	Occupiers prosecuted.
Factories in which Sections 1, 2, 3, 4 and 6 are to be enforced by Local Authorities ..	1	3	—	—
Factories not included in (1), in which Section 7 is enforced by Local Authority .. ..	27	4	—	—
Other premises in which Section 7 is enforced by the Local Authority (excluding outworkers' premises) .. ..	—	—	—	—
Total .. ..	28	7	—	—

No defects were found.

**Shops Act, 1950.**

18 visits were made under the Shops Act for the supervision of sanitary accommodation, washing facilities, and the maintenance of



suitable temperature. Informal Notices were served whenever any contraventions were observed.

### **Common Lodging Houses.**

*Public Health Act, 1936. Part IX.*

There are no registered common lodging houses in the area.

### **Pests Act, 1949.**

Your District is covered by the South Westmorland Joint Pest Control Board. Regular visits are made to your refuse tips which seem to attract rather an undesirable number of rats.

### **Rent Restriction Acts.**

No action was taken during the year under the Rent and Mortgage Interest Restriction Acts, and any contraventions of Section 4 of the Housing Act, 1936, regarding rent book entries, were corrected informally.

### **Smoke Abatement.**

No action was required.

### **Public Mortuary and Post-mortem Room.**

*Public Health Act, 1936. Section 198.*

Adequate facilities are available at Windermere and Kendal and H.M. Coroner and the Pathologist prefer to have bodies taken to the mortuary and postmortem rooms at Westmorland County Hospital, Kendal.

### **Laboratory Services.**

*Public Health Act, 1936. Section 196.*

The Public Health Laboratory Services at Preston and Carlisle provide the necessary facilities for most of our public health investigations.

### **National Assistance Act, 1948.**

*Section 47. Compulsory Removal.*

It was not necessary during the year to deal with any cases requiring removal. Such cases are extremely distressing to deal with and the course of compulsory removal is reserved to meet the emergencies of a last resort when all other methods of help have failed. Sometimes it is very hard to decide what is really in the best interests of the patient.

A special conference was held during 1961 with the Welfare Authority to see what more could be done to prevent people from getting into such difficulties. Home help services, hostels, and partial dependency schemes may meet some of the problems. I hope that the harsh step of compulsory removal will be less needed as time goes by. It is so often tantamount to a death warrant.

### **Byelaws.**

Byelaws on public health matters are in force for:---

Building.

Slaughterhouses.

Food handling.

Water misuse or contamination.

### **New Legislation.**

Home Safety Act, 1961 became operative 18th May, 1961.

Public Health Act, 1961 became operative 3rd October, 1961.

Housing Act 1961 became operative 24th November, 1961.

Factories Act, 1961 became operative 1st April, 1962.

# **APPENDIX "A".** **Laboratory Examination of the Public Water Supplies.**

Nature of Test	Standards Max.	Ambleside Raw	Ambleside Treated	Grasmere Raw	Grasmere Treated	Patterdale	Great Langdale	Little Langdale	Hartsop
Pr. coli count 37° ..	3-10	0	0	5 +	0	0	5 +	35 +	35 +
Faecal coli/strep ..	0								
Character ..	—	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Reaction pH ..	—	6.8	7.2	7.0	7.5	8.1	7.4	8.8	7.3
Ammonical Nitrogen ..	.041	.01	0	.01	0	0	0	.01	0
Albuminoid Nitrogen ..	.066	.01	.01	.01	.01	0	.01	.01	0
Total Solids ..	1000	38	52	35.2	48	50	44	44	56
Hardness—Total ..	300	18	22	20	23	33	23	28	33
Carbonate ..	—	—	15	—	19	31	17	22	25
Non-Carbonate ..	—	—	7	—	4	2	6	6	8
Chlorides ..	30	9.3	—	8.6	—	—	—	—	—
Nitrates ..	1	0	.16	0	.12	.14	.27	.12	.29
Nitrites ..	—	Minute trace	Nil	0	0	0	0	0	0
0.2 Absorbed ..	1	.36	.65	.24	.2	.06	.10	.16	.08
Heavy Metals ..	—	—	—	0	0	—	—	—	—
Rainfall 24 hours ..	—	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Date sampled ..	—	14.11.57	24.6.59	14.11.57	24.6.59	17.6.59	24.6.59	24.6.59	17.6.59
Laboratory ..	—	Liverpool	Preston	Liverpool	Preston	Preston	Preston	Preston	Preston

Chemical analyses expressed in parts per million.







